A NOTE ON LENGTH OF ADULT LIFE OF SOME AUSTRALIAN BUTTERFLIES

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Introduction

Studies on population movements of butterflies, especially *Danaus plexippus* (L.), have been under way since 1963, during which time many specimens have been marked and released using the "alar tag" method of Urquhart (1960). From the periods recorded between release and recapture an indication of possible length of life in the field can be obtained. Since little seems to have been published on this aspect of butterfly biology in Australia it has been decided to record the data so far available. As the marking programme was not designed to provide such data its limitations should be borne in mind. The specimens were nearly all captured in the field, marked and released although some were reared from the larval stage. Most, therefore, had been in flight for an unknown period before marking and many were still active when recaptured so having an expectancy of further life. Many were released again after the serial number on the tag had been noted.

Species other than *Danaus plexippus*

The data for species other than *Danaus plexippus* is summarised in Table I. Full details of release and recapture for each specimen are filed in the Australian Museum.

The period between release and recapture gives a minimum period for which the specimen was active in the field. In most cases it would have been longer by an unknown period prior to marking and in many cases for an additional unknown period after release for the second time. In some species very few specimens were marked and recaptured and the periods involved were short so that the data cannot be considered significant. Such is the case with *Graphium eurypylus* (L.), *Delias argenthona* (Fab.), *Heteronympha penelope* Waterhouse, *Vanessa kershawi* (McCoy), *Hypolimnas misippus* (L.), *Phaedyma shepherdi* (Moore) and *Acraea andromacha* (Fab.). The data suggests that *Anaphaeis java* (Sparr.) and *Delias nigrina* (Fab.) can live for at least two weeks. Both are known migrants and this period may be a little short. The same might be said for *Vanessa itea* (Fab.) and *Precis villida* (Fab.) for which the figures suggest a span of about three weeks. Although little marking of *Pieris rapae* (L.) was carried out and only four specimens recaptured, a span of four weeks is shown for one of them. A period of at least three weeks is possible for *Tisiphone abeona* (Donovan) and *Polyura pyrrhus* (L.) and four weeks for *Catopsilia pomona* (Fab.) and *Heteronympha mirifica* (Butler).

For the other species listed in Table I either a relatively long period was recorded or sufficient recaptures made to suggest that the

TABLE I.

Periods recorded between release and recapture of some Australian butterflies

Species	No. specimens recaptured after:														
	Total No. recaptured	1 week or less	1-2 weeks	2-3 weeks	3-4 weeks	4-5 weeks	5-6 weeks	6-7 weeks	7-8 weeks	8-9 weeks	9-10 weeks	10-11 weeks	11-12 weeks	12-13 weeks	13-14 weeks
Graphium euryplus	1	1													
Graphium sarpedon	25	20	3	2											
Papilio aegeus	121	73	26	14	4	3	1								
Papilio anactus	44	30	10	3	1										
Anaphaeis java	10	8	2												
Delias nigrina	4	3	1												
Delias argenthona	5	5													
Pieris rapae	4	3				1									
Catopsilia pomona	13	5	3	3	2										
Euploea core	118	51	28	13	12	2	3	2	2	1		2		1	1
Euploea tulliolus	5	2	1						1	1					
Danaus chrysippus	25	13	6	4	1			1							
Danaus affinis	8	2	4				1	1							
Danaus hamatus	11	3	2	1				1	1	1		1		1	
Heteronympha merope	92	76	6	7	2			1							
Heteronympha penelope	2	2													
Heteronympha mirifica	1				1										
Melanitis leda	6	1	2	1		1		1							
Tisiphone abeona	1			1											
Precis villida	10	7	2	1											
Vanessa kershawi	3	3													
Vanessa itea	17	12	2	3											
Hypolimnas bolina	26	16	2	4			1	1	1				1		
Hypolimnas misippus	1	1													
Phaedyma shepherdi	1	1													
Acraea andromacha	1	1													
Polyura pyrrhus	18	14	3	1											

figures might be approaching a true indication of possible length of life in the field. Although twenty five *Graphium sarpedon* (L.) were recaptured none suggested a life in excess of three weeks and of forty four *Papilio anactus* W. S. Macleay only one was recaptured more than three weeks after release. *Papilio aegeus* Donovan can live for five weeks and, judging from about the same number of recaptures (about 120), *Euploea* core is clearly able to live as long as thirteen weeks. *E. tulliolus* (Fab.) can live eight weeks and *Danaus chrysippus* (L.), *D. affinis* (Fab.), *Heteronympha merope* (Fab.) and *Melanitis leda* (L.) can live for six weeks. *Danaus hamatus* (W. S. Macleay) and *Hypolimnas bolina* (L.) are also long-lived species with a recorded potential of twelve and eleven weeks respectively. *Danaus plexippus* (see Tables II and III), for which there are records for over eighteen hundred specimens

TABLE II

Periods recorded between release and recapture—D. plexippus

Period in weeks	No. of specimens	Period in weeks	No. of specimens
Less than 1	721	13-14	7
1-2	360	14-15	8
2-3	214	15-16	7
3-4	133	16-17	6
4-5	76	17-18	11
5-6	57	18-19	7
6-7	53	19-20	3
7-8	52	20-21	—
8-9	22	21-22	—
9-10	20	22-23	4
10-11	15	23-24	2
11-12	9	24-25	—
12-13	17	25-26	2
		Total	1,806

captured in flight and several thousands of specimens marked at overwintering clusters, can live as long as six months under certain circumstances. The data for this species is dealt with below.

Whilst care needs to be taken in making generalizations from the meagre and incidentally-collected data such as that given in Table I, it seems that species of the subfamily Danainae and *Hypolimnas bolina* are longer-lived than the other species listed. These species also probably pass the adverse period of the year in some parts of their range as non-reproducing adults.

Danaus plexippus

The data in Table II is based on 1806 specimens from which it can be seen that a period of at least twenty six weeks adult life is possible. It is not feasible to give details here of the thousands of

TABLE III

Longest length of life (in days) recorded for releases each half month—D. plexippus

	Half months																					
	J		F		M		A		M		J		Jl.		A		S		O		N		D	
Coastal Queensland	20	22	5	—	26	12	10	—	42	7	6	35	73	35	19	28	15	34	40	27	17	23	13	15
Coastal N.S.W.	46	73	112	114	156	138	155	179	132	88	94	81	74	89	47	34	42	16	6	27	32	22	81	39
South Australia	—	67	23	—	13	35	48	138	124	167	55	55	6	18	—	8	34	24	1	7	—	75	—	75
Victoria	—	65	43	40	182	123	86	126	123	167	21	—	—	46	56	—	30	43	26	14	—	—	—	—

specimens marked and recaptured at overwintering cluster sites; the results confirm those obtained from the specimens discussed here. Table II data is equivalent to that given in Table I for other species. Table III gives data from the same specimens arranged seasonally and separated into four areas, (1) coastal Queensland and the north coast of New South Wales, (2) central coastal New South Wales, (3) South Australia and (4) Victoria. For each half month the longest period recorded between release and recapture is given for a specimen *released* during that half month. It can be seen that there is a distinct seasonal influence on possible length of life and that in all areas except coastal Queensland and the north coast of New South Wales, autumn releases can expect to live longer than those from spring and summer. The reason for this is to be found in differences in the breeding cycles in northern and southern populations. Details of breeding studies are to be published elsewhere but it can be stated here that in coastal Queensland and north coastal New South Wales breeding is virtually continuous throughout the year; in the other three areas there are one or more generations of which the adults breed soon after emergence followed by one generation the adults of which enter a reproductive diapause and pass the adverse period of the year (when temperatures are low and food plants are not available or are unsuitable for larvae) in a relatively inactive state (Smithers, 1972). These adults may form clusters under certain circumstances (Smithers, 1965 and in prep.). Those individuals which breed soon after emergence can expect a life of about sixty to seventy days whereas those which emerge in autumn and delay the start of breeding until the following spring can survive as longer-lived individuals through winter. In northern coastal areas, on the other hand, no specimens at any time of year live longer than about sixty or seventy days, the expected life of southerly generations which breed soon after emergence. In brief, then, most specimens of *D. plexippus* have a possible length of life of about sixty to seventy days and those of the overwintering generation may live as long as six months.

It is hoped that the publication of this short note will encourage others to make more appropriately planned studies on the longevity of Australian species. It is a study which requires little equipment and can be easily undertaken.

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